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Welcome back, **Valentin Albillo**. You last visited: Yesterday, 09:57 PM (**User CP** — Log Out)   **Current time:** 06-30-2019, 02:24 AM
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🔃 **NEW REPLY**

[VA] Short & Sweet Math Challenge #24: "2019 Spring Special 5-tier"	**Threaded Mode | Linear Mode**

04-24-2019, 07:36 AM — **Post: #41**

Massimo Gnerucci 👤
Senior Member

Posts: 1,740
Joined: Dec 2013

RE: [VA] Short & Sweet Math Challenge #24: "2019 Spring Special 5-tier"

> **Albert Chan Wrote:** ➡   (04-23-2019 06:59 PM)
>
> sb_find(), version 6. Switched to Python to extend search range.
> As expected, Python code is even shorter.

Hi Albert, really interesting (and a *little* beyond my skills), as usual, but wasn't this one of Valentin's rules? :)

> **Valentin Albillo Wrote:** ➡   (03-21-2019 04:08 AM)
>
> **Rules:**
> [list]
> [*]Using anything other than a **physical** or **emulated HP calculator** is <u>strictly disallowed</u>. Also **no** *VBA*, *Excel*. *Pascal*, *C/C#/C++*, *Java*, *Python*, *Haskell*, etc. code, please go elsewhere for that. You must write your code in a language supported in some HP calc (i.e.: **RPN**, **RPL**, **71B BASIC**/**FORTH**, etc).

Have a nice day!

———————————

Greetings,
   Massimo

-+×÷ ↔ *left is right and right is wrong*

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04-24-2019, 09:57 PM — **Post: #42**

Valentin Albillo 👤
Senior Member

Posts: 376
Joined: Feb 2015
Warning Level: 0%

RE: [VA] Short & Sweet Math Challenge #24: "2019 Spring Special 5-tier"

Hi, Bernd Grubert, Gilles and Massimo Gnerucci:

> **Bernd Grubert Wrote:** ➡   (04-20-2019 12:47 PM)
>
> Here is my solution to **Tier 2**. It is 192 bytes long, <u>due to the lack of prime number checking and the remainder function on the **HP-15C**</u>. [...] I have done the test runs on the **HP-15C** emulator on a PC, since the processing time on my DM-**15L** is <u>far too long</u>... Since the largest integer number the **HP-15C** can exactly represent is 9,999,999,999. , this implementation of the Miller-Rabin algorithm <u>can check only number up to 99,999</u>. <u>Due to memory limitations, on the real **HP-15C**</u> and the DM **15L** the longest sequence is 26 values. [...] For base 31 I got the sequence: 619, 18257, ...,(I stopped at 34139 after ~90 min., because I didn't want to wait any longer) [...] For base 7 I got the sequence: 4801, ...,(I stopped at 23451 after ~60 min.) [...] I have attached an HTML-documentation and a txt-file, that can be read into the emulator after changing the extension back to "**.15c**"

Thanks a lot for your interest and for your nice solution, **Bernd**, much appreciated !

Matter of fact, I do appreciate your solution over any purported "solutions" written in non-HP calc languages/environments, such as **Mathematica**, **Lua** and **Python**, which I expressly said in my OP that **should not be used at all** but that *certain individual who routinely disregards the rules* did nevertheless use, as I discuss below.

You, on the other hand, did abide by the rules and took the trouble to use an actual **HP calculator** (or emulator) and wote actual **RPN code**, fearlessly wrestling with its limitations, to produce an actual solution to the challenge I posted, instead of going the lazy route of using high-level languages on a full-fledged PC, which lacks any merit whatsoever and which for me amounts to **trolling**.

So, again, **Bernd**, thank you very much for your valuable contribution, my challenges are created for people like you who work hard on them to produce solutions *under the constraints given*, thus fulfilling my stated *purpose*, which is to have people using their **HP calculators**, with their limitations and warts and all, *not* using some fancy non-HP languages and/or environments, which completely defeats the purpose.

Gilles Wrote: ➡   (04-21-2019 09:06 AM)

Tier 1: Here is my solution without reading others responses. I image that there exists better way. This one is "bestial" ;D Always impressed how fast New**RPL** is. Brutal force :

1/ **HP50g** New**RPL** or **RPL** [...] Solved in only 1.3s in new**RPL** (on my PC) , 116s with **HP50g** hdw, much much slower in 779s in **RPL** (on my PC with **Emu48**). New**RPL** 600 times faster in this case on a PC. [...] 2/ **HP50g RPL** with ListExt, shorter but slower [...]

Thanks a lot for your **RPL**/New**RPL** solutions, **Gilles**, much appreciated. What I told **Bernd** above also applies equally to you so for the sake of brevity I won't repeat it here.

Again, thanks for your interest and for your time, hope you enjoyed the challenge as I certainly enjoyed your solutions, keep them coming for future ones !

Massimo Gnerucci Wrote: ➡   (04-24-2019 07:36 AM)

Albert Chan Wrote: ➡   (04-23-2019 06:59 PM)

Switched to **Python** to extend search range. As expected, **Python** code is even shorter.

Hi Albert, really interesting (and a *little* beyond my skills), as usual, but **wasn't this one of Valentin's rules?**

Valentin Albillo Wrote: ➡   (03-21-2019 04:08 AM)

Using anything other than a **physical** or **emulated HP calculator** is **strictly disallowed**. Also **no** *VBA*, *Excel*. *Pascal*, *C/C#/C++*, *Java*, *Python*, *Haskell*, etc. code, please go elsewhere for that. You **must** write your code in a language supported in some HP calc (i.e.: **RPN**, **RPL**, **71B BASIC**/**FORTH**, etc).

Thanks for pointing this out, **Massimo**, I didn't read Mr. Chan's posts because I've placed him in my *Ignore* list so that I don't read his post anymore, as he has shown an utter **disregard** for the rules I so clearly state in my challenges, thus completely **defeating** the purpose and probably ruining them for others, which I find profoundly **disrespectful**.

To wit:

- *The purpose of my challenges is to offer HP-fan fellow readers the opportunity to actually get to use their HP calculators and their languages to solve allegedly interesting math topics, so that perhaps we all learn some new exciting math facts and some worthwhile HP-calc programming techniques which are cleverly used to overcome the natural limitations of our beloved HP calcs and their languages. Nothing more and nothing else.*

If some disrespectful individual like Mr. Chan then goes on and *completely ignores* the requirement to use HP calcs and their languages (**RPN**, **RPL**, **71BASIC**, **71FORTH**, **PPL**, **Saturn** assembler, etc) and uses instead *exclusively* such software as **Mathematica**, **Lua**, **Python** or whatever on a PC to effortlessly overcome the aforementioned natural limitations of our calcs and provide almost-instant solutions, then:

- **No HP calcs/languages are used at all**, which completely *defeats* the intended purpose.

- **No HP calcs/languages limitations are overcome at all**, with was the idea, as the challenges' difficulty is geared to HP calc/languages, not to *Mathematica*/*Lua*/*Python* running on a PC where the difficulty and inconvenience are diminished by orders of magnitude, which amounts to *shameful cheating*.

- **No HP calcs/languages' new interesting programming techniques are created** for everyone to learn, which again completely *defeats* the intended purpose.

So, what this individual, Mr. Chan, is continuously doing amounts to:

- Utter **disrespect** to the rules I explicitly stated, which aren't arbitrary but do have the explicit intended purposes stated above.

- Shameful **cheating**, as he is using software/harware orders of magnitude more powerful that the intended one, namely HP calcs/languages.

- **Spoiling**, as he gives lots of versions and explicit solutions with no "spoilers" warnings whatsoever, thus spoiling the fun for any rule-abiding forum readers, and probably discouraging them from even attempting the challenge using their HP calculators.

- **Trolling**, as he has done this any number of times by now. He did that with my *cin(x)* challenge, for example, and with all the recent ones. He does it all the time though he could certainly go on and post his *Mathematica*/*Lua*/*Python* code in *Mathematica*/*Lua*/*Python* forums (as he did with my *Cin(x)* challenge; but he nevertheless posted his **Lua** or **Python** code here as well).

In one of my challenges he said something to the effect that he only has an *HP-12C* at hand but that is hardly a valid excuse as he's obviously using a PC or other device to run his *Mathematica*/*Lua*/*Python* code and there are any number of *free* emulators of HP calcs available for Windows, *Mac*, *Android* and *iOS*, such as *Free42*, *V41*, *Emu71/DOS*, *Emu71/Win*, *HP-25*, most *RPL* models, *Prime*, etc. etc., which he could easily use but he **doesn't**.

This being so, I've placed Mr. Chan in my *Ignore* list and won't read or comment on his solutions. I'm totally fed up with his continued **cheating**, **trolling** and **disrespect**.

If he's so keen on showing off his abilities he should go and post his *Lua* marvels in the *Lua* forums and his *Python* achievements in the *Python* forums, not in my challenge threads, or at the very least be an sportman and provide <u>*first*</u> an acceptable solution using HP calcs/languages, as per the rules. At any rate, if he goes on trolling my challenges here like that, I'll certainly take appropriate measures.

Best regards to all.
V.

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04-24-2019, 10:30 PM (This post was last modified: 05-13-2019 08:32 PM by Albert Chan.)   **Post: #43**

Albert Chan
Senior Member

Posts: 627
Joined: Jul 2018

RE: [VA] Short & Sweet Math Challenge #24: "2019 Spring Special 5-tier"

Hi, Valentin Albillo

I did not know people were offended.
I had deleted all posts since your last posting.

Sorry about that ...

I did explain my HP-12C can't handle primes.
I am learning the emulation software, but that take some time ...
Tried FPRIM(n) in emu71, but only gives "Err: Invalid Expr"

This is from your last PM to me:

> **Valentin Albillo Wrote:**
>
> Hi, **Albert Chan**:
>
> Your second attempt at *Tier 2* is essentially correct but for a minor detail. You posted (for base **7**):
>
> ```
> lua> sb_find(7)
> 7        1  <<<<<<<<<<<<<<
> 4801       25
> 201683       35
> 16470859        49
> 115296019        55
> ```
>
> but your first result above (**7 1**) is *incorrect* because **1** is neither a *prime* nor a *composite*, it's a <u>*unit*</u>. Not being a composite, as asked, makes it an invalid result which perhaps you might want to correct in your post before I post my solutions.
>
> Thanks for your interest and your clear & concise solutions, best regards.
> V.
> .

Update:
Replaced all my Python code with XCas, so HP Prime user can try out.
The 1 Mathematica post and Lua code got quoted by others, so I felt better leave it alone.
At the time, I was too excited when cin puzzle is solved in my head ...

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04-26-2019, 08:13 PM (This post was last modified: 04-27-2019 02:25 AM by Albert Chan.)   **Post: #44**

Albert Chan 🔓
Senior Member

Posts: 627
Joined: Jul 2018

RE: [VA] Short & Sweet Math Challenge #24: "2019 Spring Special 5-tier"
I did downloaded the **Emu71/Windows**, but unable to get the code fully worked out.

HP-71B BASIC code below only print out possible sb candidates.
The program cannot be completed without ISPRIME(), so I never posted it.

What it does is output values of <u>permutations</u> of base-B digits that have the inputed sb value.

> **Quote:**
> ```
> 10 INPUT "BASE ?"; B
> 20 INPUT "DIGITS ?"; N
> 30 DIM S(N),L(N),H(N)
> 40 INPUT "SB VALUE ?"; S(N)
> 50 I = N
> 60 GOSUB 100
> 70 END
>
> 100 L(I) = S(I)-(B-1)*(I-1)
> 110 IF L(I) < 0 THEN L(I) = 0
> 120 H(I) = S(I)
> 130 IF H(I) >= B THEN H(I) = B-1
>
> 150 IF L(I) > H(I) THEN RETURN
> 160 IF I = 1 THEN GOTO 200
> 170 S(I-1) = S(I)-L(I)
> 180 I = I-1 @ GOSUB 100 @ I = I+1
> 190 L(I) = L(I)+1 @ GOTO 150
>
> 200 T = 0
> 210 FOR K = N TO 1 STEP -1
> 220 T = T*B+L(K)
> 230 NEXT K
> 240 PRINT T;
>
> 250 INPUT "MORE?";Y
> 260 IF Y<>0 THEN RETURN
> ```

Example: for base-7, upto 12 decimal digits => 15 base-7 digits

>RUN
>BASE ? 7
>DIGITS ? 15
>SB VALUE ? 65

1694851493 → 1936973135 → **1971561941** (first prime)

>RUN
>BASE ? 7
>DIGITS ? 15
>SB VALUE ? 77

83047723205 → 94911683663 → 96606535157 → **96848656799** (first prime)

BTW, where to get ISPRIME() (or equivalent) for the HP-71B emulator ?

Edit: change PRINT "X?" @ INPUT X to INPUT "X?";X

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04-26-2019, 11:50 PM (This post was last modified: 04-26-2019 11:53 PM by rprosperi.)   **Post: #45**

rprosperi ♟
Senior Member

Posts: 3,386
Joined: Dec 2013

RE: [VA] Short & Sweet Math Challenge #24: "2019 Spring Special 5-tier"

> **Albert Chan Wrote:** ⇒   (04-26-2019 08:13 PM)
>
> I did downloaded the **Emu71/Windows**, but unable to get the code fully worked out.
>
> BTW, where to get ISPRIME() (or equivalent) for the HP-71B emulator ?

Congratulations Albert, on upgrading to EMU71! I think you will find much more participation by others with your posts if they include HP code. You happen to have made a good choice as the 71B is my favorite machine, so I can answer many questions about using it, but I can't contribute much regarding a lot of the math you frequently post.

For ISPRIME(), I don't have a LEX file with this, however the PRIMLEX LEX file (PRIM(X) returns the lowest Prime factor of X) found on this page may meet the need.

Also, to input N with a prompt, use this:

100 INPUT "What is N?"; N

--**Bob Prosperi**

04-27-2019, 01:36 AM (This post was last modified: 04-27-2019 01:45 AM by Gilles.)   **Post: #46**

Gilles ♟
Member

Posts: 162
Joined: Oct 2014

RE: [VA] Short & Sweet Math Challenge #24: "2019 Spring Special 5-tier"

> **Valentin Albillo Wrote:** ⇒   (03-28-2019 02:38 AM)
>
> ## Tier 1 - The Challenge:
> (...)
>
> Also, being a 10-digit number and having all its digits distinct means that its digits are *0, 1, 2, 3, ... , 9* in some order and thus their sum is *1 + 2 + 3 + ... + 9 = 45*, which is divisible by **9** so each *Homage* number has to be divisible by 9 too. As 9 is coprime to 41 and 271, each *Homage* number N must be divisible by their product, i.e., by *41 * 271 * 9 =* **99,999**.

Good catch the divisibility by 9. I totaly missed this.

04-28-2019, 01:08 PM (This post was last modified: 05-01-2019 02:38 AM by Albert Chan.)   **Post: #47**

Albert Chan ♟
Senior Member

Posts: 627
Joined: Jul 2018

RE: [VA] Short & Sweet Math Challenge #24: "2019 Spring Special 5-tier"

Hi, rprosperi

Thanks for the tip. I finally get **FPRIM** working, but had to switched to **EMU71/DOS**
This is my updated BASIC 71B listing.

> **Quote:**
>
> ```
> 10 ON ERROR GOTO 240
> 20 INPUT "BASE?";B
> 30 N=CEIL(12/LOG10(B)) @ DIM S(N),L(N),H(N)
> 40 FOR C=4 TO (B-1)*N
> 50 IF GCD(C,B-1)>1 OR FPRIM(C,C) THEN GOTO 80
> 60 T=0 @ I=N @ S(I)=C
> 70 GOSUB 100 @ PRINT C;T
> 80 NEXT C
> 90 END
>
> 100 L(I)=S(I)-(B-1)*(I-1)
> 110 IF L(I)<0 THEN L(I)=0
> 120 H(I)=S(I)
> ```

```
130 IF H(I)>=B THEN H(I)=B-1
150 IF L(I)>H(I) OR T THEN RETURN
160 IF I=1 THEN GOTO 200
170 S(I-1)=S(I)-L(I)
180 I=I-1 @ GOSUB 100 @ I=I+1
190 L(I)=L(I)+1 @ GOTO 150

200 FOR K=N TO 1 STEP -1
210 T=T*B+L(K)
220 NEXT K
230 T=FPRIM(T,T) @ RETURN
240 T=-T @ RETURN
```

```
>RUN
BASE? 7
25 4801
35 201683
49 16470859
55 115296019
65 1971561941
77 96848656799
85 -1.3564461457E12

>RUN
BASE? 31
49 619
77 18257
91 59581
119 1787459
121 2769601
133 13851853
143 22164503
161 372178931
169 629810569
187 7987533097
203 23073248663
209 54109095389
217 247613526037
221 357635354291
247 -6.82312829953E12
253 -1.19404745241E13
259 -1.70578207488E13
```

Ignore lines with negative numbers. It just meant T (for the sb value) overflow 12 digits.

Note: It is possible primes not in sorted order. Example:
```
>RUN
BASE? 2
4 23
6 311
8 383
...
36 206141652991
38 -1.01361228185E12 <- actual T = 1030791102463
39 824633720831
40 -1.09951162777E12 <- actual T = 2196875771903
```

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